

CREAM-BASED FOOD COMPOSITION AND PROCESS OF MANUFACTURE

CROSS-REFERENCE TO RELATED APPLICATIONS

- This is a continuation-in-part of PCT Application
5 No. PCT/EP98/04930, filed July 23, 1998, the content of which
is expressly incorporated herein by reference thereto.

FIELD OF INVENTION

- This invention relates to cream-based food
10 compositions and processes for preparing the same. More
particularly, the invention relates to the use of these cream
compositions and processes in the manufacture of particular
food compositions.

15 BACKGROUND OF THE INVENTION

- In numerous applications, such as those required by
the food processing industry, a simple and rapid process for
the production of a cream with a creamy texture and fresh
taste is desirable. The preparation of certain cream-based
20 food compositions is generally known for this purpose.

- European Patent Application 0714608 describes a
process for the manufacture of appetizers from a mixture
containing in particular soft white cheese. This soft white
cheese is pasteurized and cooled to 10°C before being extruded
25 and then frozen, so that it can then be cut into portions
which are subsequently coated with a fat-based topping.

- Furthermore, European Patent Application 0687420
describes a process for the manufacture of a biscuit coated
and filled with a cream containing living lactic acid
30 bacteria, exhibiting a water activity (A_w) of 0.75-0.86 and
comprising a sufficient amount of fatty substance so that it
is in the form of a water-in-oil emulsion.

- European Patent Application 0818149 discloses an
aerated food composition constituted by an oil-in-water
35 emulsion comprising 20% to 45% fats, milk proteins, possibly
sugars, and 20% to 38% water, having an acid pH of from 3.5 to
6 and obtained by emulsifying a mixture of an aqueous phase

based on fresh cheese, yogurt or sour cream and a fat phase comprising butter or vegetable fat, followed by pasteurizing the emulsion and foaming.

Despite these prior art formulations, there remains
5 a need for creams that have a creamy texture and a fresh taste for use in the manufacture of food compositions.

SUMMARY OF THE INVENTION

The present invention relates to a simple and rapid
10 process for producing a cream composition having a creamy texture and a fresh taste, and to a process for producing this cream.

The process according to the present invention, comprises preparing a mixture that typically contains from
15 about 10% to 20% of milk derivatives, from about 8% to 30% of sugars, and from about 10% to 60% of fermented dairy product. The mixture may contain up to about 25% of sour cream or of dairy cream containing from about 25% to 45% of fatty substance, up to about 35% of a texturizing agent, up to about
20 20% of an aromatic product and up to about 0.5% of salt. The mixture is prepared by stirring together the ingredients. This mixture is then heat treated at a temperature of about 60°C to 115°C for about 7 seconds to 5 minutes. Next, the temperature of the mixture is adjusted to about 15°C to 40°C,
25 and about 10% to 45% of a molten fatty substance, with respect to the total weight of the mixture, is added to the mixture with stirring, so as to obtain a homogeneous cream which exhibits an A_w of about 0.80 to 0.91.

In one embodiment, the milk derivative includes at
30 least one of powdered unskimmed milk, powdered skimmed milk, sweetened evaporated milk, or combinations thereof. In another embodiment, the fermented dairy product includes at least one of fermented milk, yogurt, cream cheese, powdered fermented milk diluted in milk or water, powdered yogurt
35 diluted in water or milk, concentrated yogurt, concentrated cream cheese, powdered cream cheese, quark diluted in water or milk, or combinations thereof. The sour cream or dairy cream is preferably present in an amount from about 0.01% to 25% of

the mixture to increase the organoleptic or smoothness qualities of the mixture.

When used, the texturizing agent is present in an amount from about 0.01% to 35% and includes at least one of
5 maltodextrin, fermented cereal product, or combinations thereof. Similarly, the aromatic product is present in an amount from about 0.01% to 20% and includes at least one of honey, cocoa, coffee, caramel, hazel-nuts, almonds, vanilla, fruit chunks, whole fruits, fruit syrups, concentrated fruit
10 juices, or combinations thereof. Also, the salt is preferably present in an amount from about 0.01% to 0.5%.

In another embodiment, the invention includes adjusting the pH of the mixture to about 4 to 6 before the mixture is heat treated. If desired, a plurality of living
15 lactic acid bacteria can be added to the mixture at a concentration of about 10^8 to 10^{11} per gram of the mixture after having adjusted the temperature of the mixture to about 15°C to 40°C. Aeration of the homogenous cream is possible.

The invention also relates to a cream-based food
20 composition that includes the previously described mixtures. This composition may be disposed on at least one layer of a biscuit. In a preferred embodiment, the composition is disposed between each layer of a biscuit having two layers. In another embodiment, the food composition preferably has a
25 water activity (A_w) of about 0.75 to 0.88.

DETAILED DESCRIPTION OF THE INVENTION

It has now been discovered that the process according to the present invention makes it possible to
30 produce a cream that retains a creamy texture and a fresh taste even after 45 days at refrigerator temperature. The cream according to the present invention has the advantage of being edible directly after storage at refrigerator temperature or several hours after having been exposed to room
35 temperature.

In this description, the expression "milk derivative" will be employed to denote powdered skimmed milk, powdered unskimmed milk or sweetened evaporated milk, while

the term "biscuit" will be employed to denote any dough-based preparation, such as sponge cake, pound cake, gingerbread, brioche rolls, or Viennese bread and buns.

In order to make use of the present process, a specific mixture is prepared. This mixture typically contains about 10% to 20%, and preferably from about 15% to 19%, of a milk derivative; from about 8% to 30%, preferably from about 12% to 22%, of a sugar; and from about 5% to 60%, and preferably from about 10% to 35%, of a fermented dairy product. A number of optional ingredients may be included, if desired. For example, from about 0% to about 25%, and preferably from about 5% to 15%, of sour cream or of a dairy cream containing from about 25% to about 45% of a fatty substance of the sour cream or dairy cream; from about 0% to about 35%, and preferably from about 10% to 25%, of a texturizing agent; from about 0% to about 20%, and preferably from about 5% to 15%, of an aromatic product; and from about 0% to about 0.5%, preferably from about 0.1% to 0.4%, of salt may be used. The mixture is thus prepared by stirring the ingredients in any suitable mixing device, such as a turbomixer. The mixture according to the present invention can also be formulated to contain a supplement of inorganic salts, functional nutritional compounds and/or vitamins in conventional amounts.

It is possible to use any suitable form of sugar, such as sucrose, invert sugar syrup, glucose syrup, honey, or combinations thereof.

It is possible to use any suitable type of fermented dairy product, such as fermented milk, yogurt, cream cheese, powdered fermented milk diluted in milk or in water, powdered yogurt diluted in water or in milk, concentrated yogurt, concentrated cream cheese, powdered cream cheese, quark diluted in water or in milk, or combinations thereof.

It is possible to use sour cream or dairy cream containing from about 25% to 45% of fatty substance, so as to increase the organoleptic qualities of the mixture, in particular its smoothness. When the sour cream or dairy cream

is included, it is preferably present in an amount of at least about 0.01%.

Maltodextrin, fermented cereal product, or combinations thereof, can optionally be included as a
5 texturizing agent, so as to give body to the mixture while limiting its sweet flavor. When the texturizing agent is included, it is present in an amount from at least about 0.01%.

It is also possible to include an aromatic product,
10 such as honey, cocoa, coffee, caramel, hazelnuts, almonds, vanilla, fruit syrup, concentrated fruit juices, or combinations thereof. When the aromatic product is included, it is present in any taste perceptible amount and generally at least about 0.01%.

It is also possible to include a flavoring agent,
15 such as cocoa, coffee, hazelnuts, vanilla, or fruit flavors, in solid, powdered, or liquid form, or combinations thereof. The flavoring agent can be added in any desired amount, but typically is included in an amount of at least about 0.1% by
20 weight of the mixture.

It is also optional, but preferred, to include
lemon, cherries, strawberries, raspberries, blackberries,
apricots or peaches as whole fruits, fruit chunks, or
combinations thereof. The whole fruits and fruit chunks can
25 be candied fruits, uncandied fruits, semi-candied fruits, or freeze-dried fruits, and can be added in an amount of between 2 and 25% by weight of the mixture.

Before the heat treatment, the pH of the mixture is preferably adjusted to about 4 to 6, depending on the acidity
30 of the aromatic product contained in the mixture. In the case where the aromatic product is acidic, the pH of the mixture is very precisely adjusted, so as not to destroy the smooth structure of the mixture. When too high, the pH can be adjusted by adding from about 0.1% to 2% of an organic acid,
35 such as lactic or citric acid, to the mixture. One of ordinary skill in the art will be readily be able to determine other suitable acidic or basic agents that are edible and suitable for adjusting the pH.

The mixture is then heat treated at about 60°C to 115°C for approximately 7 seconds to 5 minutes, so as to pasteurize it. If it is desired to set the mixture aside before adding the fatty substance thereto, it is possible, if
5 appropriate, to cool it, so as to store it at about 8°C to 20°C and to maintain it thus under good hygienic conditions. The temperature of the mixture is then subsequently adjusted to about 15°C to 40°C. It is possible to incorporate, in the mixture, from about 0.02% to 0.5% of crystalline lactose per
10 100 g of mixture, after having adjusted the temperature of the mixture to the temperature range of about 15°C to 40°C.

Living lactic acid bacteria can then optionally be added to the mixture at a concentration of about 10^8 to 10^{11} , per gram of mixture, after having adjusted the temperature of
15 the mixture to the temperature range of about 15°C to 40°C. The living lactic acid bacteria can be added in dried form, in the form of a fresh or frozen concentrated culture, or in the form of a fermented dairy product. By adding this concentration of live bacteria during preparation, the desired
20 final levels can be achieved. The final concentration would be between about 10^4 to 10^9 per gram.

From about 10% to 45% of a molten fatty substance, with respect to the total weight of the mixture, is then added to the mixture with stirring, so as to obtain a homogeneous
25 cream that exhibits an A_w from about 0.80 to 0.91. In one embodiment, the A_w is from about 0.86 to 0.91, and in another embodiment, the A_w is from about 0.87 to 0.91. The fatty substance can be vegetable fat, the melting point of which is greater than about 30°C, or a mixture of such vegetable fats
30 and of animal fat. In particular, butter is the most preferred fatty substance.

It is then possible to aerate the cream, so as to make it lighter. It is possible in particular to aerate it by incorporating therein, by continuous injection, in particular
35 from about 25 ml to 150 ml of an inert gas, such as nitrogen or other gases, typically air or carbon dioxide, per 100 g of cream. If desired, it is also possible to utilize the cream without aeration.

Another subject of the present invention is a food composition comprising a cream obtained by the process, which cream is then cooled and deposited on at least one layer of biscuit, preferably between two layers of biscuit.

Moreover, this food composition can be stored for at least 45 days at typical refrigerator temperatures, that is to say at about 4°C to 8°C. The food composition according to the present invention can be consumed immediately after storage at refrigerator temperature or a few hours, in particular about 3 h to 12 h after having been removed from a refrigeration area and having been left at room temperature.

The food composition can be coated entirely or partially with chocolate, a chocolate substitute, or an icing of the fondant type.

Moreover, the food composition according to the present invention can contain, in the cream or in the biscuit, lactic acid bacteria at a final concentration of about 10^4 to about 10^9 per gram of the food composition.

EXAMPLES

The preparation process and the food composition according to the present invention are described in more detail in the examples below where the percentages are given by weight, except when otherwise indicated.

Example 1

A food composition with a strawberry aroma is prepared.

To do this, a mixture containing 17% of powdered skimmed milk, 14% of sucrose, 2.3% of glucose syrup, 20% of cream cheese, 11% of yogurt, 5% of dairy cream containing 35% of fatty substance, 20% of maltodextrin, 10% of strawberry pulp and 0.7% of powdered strawberry essence is prepared with stirring in a turbomixer.

The pH of the mixture is adjusted to 4.4 by adding 1.5% of lactic acid thereto.

The viscosity of the mixture is measured using a Brookfield viscometer sold by the Company Brookfield

Engineering Laboratories Inc., Stoughton, USA. The mixture exhibits a viscosity of 7600 cPs (7,600 mPa.s) at 29°C.

The mixture is then heat treated at 80°C for 3 minutes.

5 The mixture is then adjusted to 32°C before incorporating 0.04% of crystalline lactose per 100 g of mixture.

To obtain a homogeneous cream, 20% of molten fatty substance, with respect to the total weight of the mixture is
10 added.

A homogeneous cream is thus obtained which exhibits an A_w of 0.91 and a pH value of 4.3.

Before depositing this homogeneous cream between two layers of a biscuit, it is cooled and then aerated by
15 incorporating therein 70 ml of nitrogen per 100 g of cream.

Using a depositing nozzle, 20 g of this cream are then deposited between two layers of biscuit, each layer weighing 6 g.

A food composition is thus obtained with a
20 strawberry aroma that has a creamy texture and that exhibits a fresh taste.

This composition is wrapped, e.g., in a hermetically closed plastic sachet, and is then stored at refrigerator temperature. It can be readily stored at refrigerator
25 temperatures for 8 weeks.

Example 2

A food composition with a cocoa aroma is prepared.

To do this, a mixture containing 15% of powdered
30 skimmed milk, 18% of sucrose, 4% of invert sugar syrup, 19% of cream cheese, 14% of yogurt, 6% of dairy cream containing 35% of fatty substance, 19% of maltodextrin, and 5% of powdered cocoa is prepared with stirring in a turbo mixer.

The viscosity of the mixture is measured using a
35 Brookfield viscometer sold by Brookfield Engineering Laboratories Inc., Stoughton, USA. The mixture exhibits a viscosity of 12,000 cPs (12,000 mPa.s) at 33°C with an RV5 unit at a rotational speed of 10 rpm.

The mixture is then heat treated at 80°C for 3 minutes.

The mixture is then adjusted to 32°C before incorporating 0.04% of crystalline lactose per 100 g of
5 mixture.

To obtain a homogeneous cream, 25% of molten fatty substance with respect to the total weight of the mixture, is then added with stirring.

A homogeneous cream is thus obtained which exhibits
10 an A_w of 0.89 and a pH value of 5.8.

Before depositing this homogeneous cream between two layers of biscuit, it is cooled and then aerated by incorporating therein 60 ml of nitrogen per 100 g of cream.

Using a depositing nozzle, 14 g of this cream are
15 then deposited between two layers of biscuit, each weighing 7 g.

A food composition is thus obtained with a cocoa aroma that has a creamy texture and which exhibits a fresh taste.

This composition is wrapped in a hermetically closed plastic sachet and is then stored at refrigerator temperature.
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Example 3

A food composition with a blueberry aroma is
25 prepared.

To do this, a concentrated yogurt with 76% milk, 24% skimmed milk powder, and yogurt ferments is prepared. In this concentrated yogurt, living lactic acid bacteria are present at a concentration of 5×10^8 per gram of the concentrated
30 yogurt.

A mixture containing 19% of milk, 14% of skimmed milk powder, 17.3% of sugar, 14% of inverted sugar, 20% of maltodextrin, 13% of blueberry pulp, 0.83% of powdered blueberry essence, 1.7% of lactic acid, 0.17% of salt is
35 prepared with stirring in a turbomixer.

The mixture is then pasteurized before adding 0.03% of microcrystalline lactose.

Then 33% of the concentrated yogurt, with respect to the total weight of the mixture, is added with stirring to the mixture.

To obtain a homogeneous cream 33% of molten fatty substance, with respect to the total weight of the mixture, is then added with stirring.

A homogeneous cream is thus obtained which exhibits an A_w of 0.91, a pH of 4.5 and a specific gravity of about 650 g/l. This homogeneous cream contains living lactic acid bacteria at a concentration of 10^8 per gram of the cream.

Before depositing this homogeneous cream between two layers of biscuit, it is cooled and then aerated by incorporating therein 60 ml of nitrogen per 100 g of cream.

Between two layers of biscuit, each weighing 10 g, 20 g of cream is deposited.

The food composition has an A_w of 0.88 and contains living lactic acid bacteria at a concentration of 5×10^7 per gram of the food composition. After being chilled for 45 days, the food composition still contains living lactic acid bacteria at a concentration over of 10^6 per gram of the food composition.

The term "about" as used herein in connection with one or more numbers or numerical ranges, should be understood to refer to all such numbers, including all numbers in a range.

All percentages herein are weight percentages unless otherwise specified.

The invention described and claimed herein is not to be limited in scope by the specific embodiments herein disclosed, since these embodiments are intended as illustrations of several aspects of the invention. Any equivalent embodiments are intended to be within the scope of this invention. Indeed, various modifications of the invention in addition to those shown and described herein will become apparent to those skilled in the art from the foregoing description. Such modifications are also intended to fall within the scope of the appended claims.